

NEW YORK STATE NUTRIENT STANDARDS PLAN

REVISED July 7, 2011

INTRODUCTION AND OVERVIEW

This document updates and supersedes the April 15, 2009 NYS Nutrient Standards Plan and has been prepared by the Division of Water, New York State Department of Environmental Conservation (DEC or the Department). It describes New York's progress to date, and our plans to derive and establish criteria to protect the best uses of flowing and ponded freshwaters, and estuaries, from excessive nutrients.

Completion of this work is contingent upon a number of factors, including DEC staffing levels, competing DEC and USEPA priorities, and sufficient federal funding to complete the work on estuaries in a timely manner. In addition, the impacts upon both the regulated community and other DEC programs from adding numerical nutrient criteria will be widespread and significant. DEC will ensure that these impacts are fully assessed, understood, and vetted, and a plan for criteria implementation is in place, before the criteria are proposed.

DEC believes that the most appropriate response to USEPA's push for state numerical nutrient criteria is for NY to derive its own, state-specific criteria based on data collected from NYS waters, as detailed below. Such criteria will most accurately define nutrient levels (and other associated indicators) appropriate to protect the best (designated) uses of New York's waters.

At least initially, these criteria will be in the form of DEC Division of Water "guidance values." Guidance values, in the Division of Water's TOGS 1.1.1, which represent numerical translations of New York's existing narrative standards, and have been widely used as an equivalent to water quality standards and accepted by USEPA Region 2 for more than 25 years. DEC expects to use its guidance values for nutrients in a similar manner.

NEW YORK STATE'S EXISTING PROGRAM TO ADDRESS NUTRIENTS

New York has a strong existing program to address water quality impacts from nutrient over-enrichment, including narrative standards, a statewide numerical guidance value for phosphorus, and several, waterbody-specific numerical values.

Narrative Standards

New York has existing narrative ambient water quality standards for phosphorus and nitrogen, promulgated in regulation in 6NYCRR 703.2. This standard sets forth limits for these two nutrients as A None in amounts that will result in growths of algae, weeds and slimes that will impair the waters for their best usages. @

Statewide Guidance Value

New York has an existing ambient water quality guidance value of 20 ug/l for phosphorus, established as a translation of the above-referenced narrative standard to protect recreational use that applies to Classes A, AA, A-S, AA-S, and B waters for which the letter "P" (ponds, lakes, and reservoirs) appears in the Water Index Number, excluding Lake Champlain.

Waterbody-Specific Values for Phosphorus

- § Lakes Erie and Ontario: The Lake Erie target TP concentration is divided up by basin, with the Western Basin equal to 15 µg/L and the Central and Eastern basins equal 10 µg/L. Lake Ontario's target is 10 µg/L. These target P numbers for Erie and Ontario are in supporting documents to the Great Lakes Water Quality Agreement (GLWQA).
- § Lake Champlain (NY side): Main Lake - 10 µg/L, South Lake - 25-54 µg/L, remainder of lake - 14 µg/L. These values are from the 1993 New York-Québec-Vermont Water Quality Agreement (New York, Québec, Vermont 1993) and were also used in the phosphorus TMDL.
- § New York City Watershed reservoirs: 15 µg/L for terminal reservoirs. This value (plus the statewide guidance value of 20 µg/L) was used in the reservoir phosphorus TMDLs.

Waters of the Forest Preserve: Natural conditions based on the provisions contained in Article XIV of the New York State Constitution.

State Framework for Managing Nutrient Pollution

New York has long recognized the impact of nutrient pollution on the waters of the state. In its most recent Statewide Water Quality Report, nutrient eutrophication was cited as contributing to 20% of all impaired waters and as a contributor to over 50% of waters with other impacts. As a result, New York State has taken other specific steps beyond the current criteria development effort to reduce nutrient impacts through a range of regulatory programs, including establishing of nutrient TMDLs in priority watersheds (e.g., Long Island Sound, Lake Champlain, Onondaga Lake, and Croton River), implementing statewide municipal stormwater permitting (MS4) and Concentrated Animal Feeding Operations (CAFO) programs to address priority sources of nutrients, DEC's Technical and Operational Guidance Series (TOGS) 1.3.6 for lakes, "reasonable potential" analysis for new or increased discharges, working with the agricultural community (through the NYS Department of Agriculture and Markets and the NYS Farm Bureau) to identify Best Management Practices, and reaching out to local stakeholders through Soil and Water Conservation Districts and nonpoint source workgroups to achieve effective

nutrient reductions. These efforts echo the *Recommended Elements of a State Framework for Managing Nutrient Pollution*, contained in USEPA's recent "Working in Partnership" memorandum (March 16, 2011). Not only do these efforts complement the nutrient criteria development, but they will also provide valuable information regarding the ultimate regulatory implementation of the standards.

NEW YORK'S PLAN TO REVISE AND EXPAND ITS NUTRIENT CRITERIA PROGRAM

There are seven basic elements to New York State's approach:

- 1.a. Human Health - Lakes and Reservoirs
- 1.b. Human Health - Flowing Waters
- 2.a. Recreation - Lakes and Reservoirs
- 2.b. Recreation - Flowing Waters
- 3.a. Aquatic Life - Flowing Waters
- 3.b. Aquatic Life - Lakes and Reservoirs
4. Estuaries

DEC prepares supporting technical documents ("Fact Sheets") that describe the basis and derivation for its numerical water quality standards and guidance values. For nutrient criteria Fact Sheets for human health in lakes and reservoirs (1a), recreation in lakes and reservoirs (2a), and for protection of aquatic life in flowing waters (3a), have been drafted by DEC and were reviewed by USEPA and the N-STEPS scientific peer review process in 2011. These Fact Sheets are currently being revised to reflect the review and resultant comments provided.

These Fact Sheets are an initial step in this process and guidance values will not be proposed until the impact upon both the regulated community and other DEC programs (permitting, assessment, and listing) have been determined, communicated to those affected, and a comprehensive plan for the criteria's implementation has been prepared. Further, DEC will make sure that the technical work on the other group of freshwater criteria (for human health and recreation in flowing waters and for aquatic life for lakes and reservoirs) has progressed to the point that their relative stringency compared to the first group is known. This may affect both the timing of the proposal of various criteria, and whether all of the above criteria are ultimately proposed, given that it may make more sense to only propose only the most stringent to protect the most sensitive use for each waterbody type (flowing or ponded waters).

The Division of Water is also working with the DEC's Division of Fish, Wildlife and Marine Resources on the derivation of nutrient criteria to protect aquatic life. Part of this discussion is to consider potentially competing uses of the State's waters that may be affected by nutrient criteria. For example, it is possible that the criteria to protect one best use (e.g., public water supply or contact recreation) may not adequately support certain fish species (e.g., warm water fisheries) and

thus may inhibit fishing in that waterbody. These differences must be addressed before nutrient criteria are proposed, and will be included in the approach being developed to their implementation (below).

The initial focus for development of freshwater nutrient criteria will be on phosphorus, which we believe to be the critical or limiting nutrient for inland waters. As noted below, criteria for nitrogen for freshwaters will be developed later, as resources permit. Although criteria for nitrogen have been drafted to protect aquatic life in flowing freshwaters, their implementation may be done on an as-needed basis where nitrogen is limiting. For estuaries, the reverse is true, where the key nutrient, nitrogen, will be addressed first, followed by phosphorus as resources permit.

Milestone	Rivers and Streams		Lakes and Reservoirs		Estuaries	
	TP	TN	TP	TN	TP	TN
Plan for collection of data	Done	Done	Done	*	*	2011 -2012
Collection of info and data	Done	Done	Done	*	*	Some already done but all needed data by end of 2012
Analysis of info and data	Done	Done	Done	*	*	2013
Proposal of criteria**	Draft values shared with USEPA; public release of draft criteria by the end of 2012	Draft values shared with USEPA; public release of draft criteria by the end of 2012	Draft values shared with USEPA; public release of draft criteria by the end of 2012	*	*	2014 - Draft values will be shared with USEPA in 2014. Public release of draft criteria in 2015
Adoption of criteria**	2013	2013	2013	*	*	2016

* For lakes and reservoirs (freshwaters), DEC believes that criteria for phosphorus should be the first priority for our limited resources, given that virtually all freshwater lakes and reservoirs are phosphorus-limited. Criteria for nitrogen will be developed for nitrogen-limited waters as resources permit. See section 3.b. of this Nutrient Standards Plan, below for additional information. For estuaries, the reverse is true, as DEC believes that nitrogen is the limiting nutrient. There, criteria for nitrogen will be the Department's highest priority, followed by criteria for phosphorus as resources permit.

**Dates reflect completion of DEC plan for implementation of nutrient criteria

In addition, New York State believes nutrient criteria development should go beyond a focus on just the causal stressors of phosphorus and nitrogen, and also incorporate appropriate response variables, such as chlorophyll *a*, water clarity, and measures of biological impact. These response variables provide a more direct link to designated use support and impact. Furthermore, the inherent natural variability between nutrient levels and actual in-stream impacts necessitates some deference to actual water quality condition and/or consideration of use support. Using causal/stressor variables of phosphorus and nitrogen independent of any measure of response will result in the characterization of some unimpacted waters as having impacts, or impacted waters that are inaccurately characterized as meeting the criteria. How the stressor-response variable discussion unfolds will have considerable impact on the direction of New York State's nutrient criteria effort. DEC will continue to work with USEPA Region 2 to determine the most appropriate mechanisms for managing the stressor-response relationships in the context of criteria development and implementation.

Lastly, the development of the individual criteria Fact Sheets requires making some assumptions about the levels of algal growth, water clarity, biological system change, and other conditions that correspond to levels of impact along a spectrum from unimpacted to threatened, stressed and impaired uses. It may be appropriate to revisit these assumptions if the resulting criteria produce assessment results that are significantly out of step with our understanding of actual water quality conditions in the waters of the state.

1. FRESHWATER NUTRIENT CRITERIA TO PROTECT HUMAN HEALTH AND SOURCES OF POTABLE WATER SUPPLY

Summary

For lakes and reservoirs classified as sources of potable water supply (Classes A, AA, A-Special and AA-Special), research to evaluate the relation between nutrients (and related response variables) and the production of disinfection byproducts (DBPs) and algal toxins has been completed. Additional research is being conducted to determine equivalent criteria for flowing water systems of Classes A, AA, A-S, and AA-S. Because nearly all freshwater systems in NYS are believed to be phosphorus-limited rather than nitrogen-limited, criteria are targeted at phosphorus (and the response variable chlorophyll), and nitrogen criteria would be only developed on a site specific and as-needed basis (e.g., when it can be demonstrated that a waterbody is nitrogen limited).

Introduction

Nutrients, and associated response variables, are known to play a role in two human health concerns related to drinking water, namely, disinfection by-products (DBPs) and cyanotoxins (also known as algal toxins).

Public health officials have become increasingly concerned with the formation of DBPs in public water supplies over the past decade. DBPs (e.g., Chloroform and related compounds) are a class of organic chemicals formed as the result of the disinfection process. These compounds are believed to be carcinogenic. DBPs are formed from a chemical reaction between chlorine and Natural Organic Matter (NOM). In general, the higher the levels of organic matter within the source water, the greater the potential for the formation of DBPs. The NOM present in a lake and/or reservoir can originate from either the surrounding watershed (allochthonous production) or can be generated within the waterbody itself (autochthonous production). This latter process can be controlled by a number of factors (e.g., nutrient levels, light, etc.). However, for freshwater lakes within North America, the controlling factor for autochthonous production is most often the nutrient phosphorus. Thus, a primary determinant in the production of DBPs for surface water supplies is the level of nutrients and primary productivity within the receiving water.

Algal toxins are another group of compounds that pose a potential risk to potable water supplies. These compounds are produced under certain circumstances by a group of autotrophic bacteria classified as cyanobacteria B (also known as blue-green algae). These toxins are capable of causing harm to humans and other animals. Under certain conditions these organisms can increase significantly in numbers resulting in what is termed an algal bloom. These bloom events are more likely to occur under elevated nutrient conditions. Thus, one important element in the management of cyanobacteria and related toxin production can be limiting nutrient levels in the source water.

a. Human Health Protection for Lakes and Reservoirs
(Water Classes A, A-S, AA, AA-S) (Cliff Callinan)

The field component for the ponded water effort was conducted in 2004 and 2007 and consisted of the collection of paired measurements of nutrient related indices (e.g., total phosphorus and chlorophyll a) and human health related indices (disinfection by-product formation potentials and algal toxins) in approximately 20 ponded systems in New York State. Targeted waters were selected to encompass a relatively broad range of trophic conditions. These paired measurements were used to assess the relationship between nutrient related parameters and human health related indices. The relationships, in combination with modeling activities and comparison to existing water supply regulatory data, are being used to establish ambient water quality criteria for the protection of potable water supply sources.

Nutrient Criteria Products

The project takes an effects-based approach to establishing nutrient criteria. Criteria are being developed for total phosphorus (TP) and chlorophyll a. Criteria based on the results of the study outlined above will be proposed as guidance values as outlined in the “Introduction and Overview” section of this plan. Although the study was conducted on Class AA and A waters, the criteria derived are expected to be appropriate for all ponded surface waters classified as

sources of potable water supply. Thus, any criteria derived will also be adopted for Class AA-Special and A-Special waters.

The ponded water research investigation (entitled Disinfection By-Products/Algal Toxins Study) was completed September 30, 2009, and a technical report of the findings submitted to USEPA Region 2. A draft Fact Sheet for the proposed criteria has been developed based upon the technical findings and this document has undergone two levels of external review (USEPA Region 2 and an external peer review). External review comments are currently being evaluated and will be addressed over the coming months.

b. Human Health Protection for Flowing Waters
(Water Classes A, A-S, AA, AA-S) (Cliff Callinan)

In 2007, USEPA provided follow-on funding to DEC to extend efforts regarding nutrient criteria as they relate to potable waters to *flowing* water systems. It is likely that nutrient relationships in flowing water systems are different from ponded water systems due to the fact that there is less opportunity for resident algae to fully utilize available nutrients in these systems, and therefore there is likely to be lower primary productivity per unit of nutrient than in ponded systems. The subsequent investigation (for flowing water systems) followed a similar experimental design as for the earlier effort, and collected samples on approximately 15 flowing water systems throughout New York State.

The flowing water research investigation (entitled River Disinfection By-Products/Algal Toxins Study) was completed on December 31, 2010, and a technical report of the findings was submitted to USEPA Region 2. A draft Fact Sheet for proposed criteria, based upon the technical findings, will be developed over the next year.

2. FRESHWATER NUTRIENT CRITERIA TO PROTECT PRIMARY CONTACT RECREATION

a. Primary Contact Recreation Protection for Lakes and Reservoirs
(Water Classes A, A-S, AA, AA-S, B, C, and D): (Scott Kishbaugh)

Summary

The perception data compiled by the Division of Water=s Citizens Statewide Lake Assessment Program was used to identify levels of phosphorus (as well as the response variables, water clarity and chlorophyll *a* that correspond to a range between unimpaired and impaired uses. These criteria will be applied to all classes of freshwaters, but will specifically except those waterbodies for which site-specific criteria have already been established. Because nearly all freshwater systems in NYS are phosphorus-limited rather than nitrogen-limited, the nitrogen criteria would

apply only when it can be demonstrated that a waterbody is nitrogen limited. New York will consider whether it would be appropriate to also establish some form of numeric criteria for a nitrogen-limited system.

Background

Protection of primary contact recreation from excess nutrients may require more stringent water quality criteria than those for protection of human health and aquatic life. To identify the connection between nutrients and recreation, the DEC completed a two year study for USEPA Regions I, II, and V involving the use of use impairment data linked with water quality data (total phosphorus, chlorophyll *a*, and Secchi disk transparency) to identify reference conditions as part of the nutrient criteria development process. Data were evaluated from eight states and three USEPA regions, all collected in a similar manner using standardized lake perception surveys, spread over eight aggregate USEPA ecoregions, twenty-six level III USEPA ecoregions, and 200,000 samples. One proposed methodology defines reference waterbodies as those that are Aslightly impaired@ at a frequency of <10-25%, consistent with the CALM methodology (as adapted by several states) for Afully supporting@ designated uses and historical precedent for utilizing use impairment data in identifying state guidance values. Reference conditions are calculated from the use impairment dataset using these definitions for reference waterbodies, stratified by waterbody depth and location within the state. Another methodology defines reference as corresponding to sampling conditions described as Acould not be nicer@ or (having) Avery minor aesthetic problems,@ while another method applies USEPA guidance encouraging the use of the Amost protective....approach for reference condition calculations@, using USEPA guidelines to identify Adequate@ datasets. A Acomposite@ methodology assigns the percentage of lakes meeting the criteria in previous methodologies to the entire USEPA nutrient dataset. A summary of the methodologies and the resulting reference condition calculations is available in the final report for this study provided to USEPA Regions I, II, and V. These methodologies have been employed to evaluate the conditions associated with unimpaired recreational aesthetics.

A parallel approach has been to evaluate the relationship between nutrient stressors and the production of algae that impacts contact recreation by compromising the safety of swimmers due to insufficient water clarity, the production of periodic nuisance algal blooms, and the production of algal toxins. Ambient lake water quality data collected by DEC can be used to identify the frequency with which conditions associated with comprised safety occur in New York State, as established by conditional probability plots to achieve a level of negligible risk.

Nutrient Criteria Products

New York has used these findings to identify supplemental calculations of reference conditions for unimpaired aesthetics and thresholds for unacceptable risk for swimming safety to derive draft criteria for waterbodies classified for primary contact recreation. Because primary contact recreation is a best use for Class AA, AA-S, A, A-S, and B, and because regulations also require that water quality in Class C and D waters be suitable for primary contact recreation (even though

other factors may limit their use for this purpose), these criteria will be applied for all ponded freshwaters.

These criteria will replace the existing Phosphorus value of 20 ug/L, as the new criteria for protection of the primary contact recreation use, and will have greater scientific strength, being derived via a more diverse process that considers a frequency distribution/statistically based approach, a threshold based approach (the existing narrative standard and guidance value), a use-impairment based approach (lake perception/use impairment study calculations), and a risk-assessment based approach (swimmer safety distribution plots, based on the presence of algal blooms and the production of algal toxins).

Draft proposed AWQVs have been established and will continue to be evaluated in the context of the USEPA and N-STEPS peer review comments, although all of the data collection has been completed. The final draft AWQVs will be contingent upon decisions about where to "draw the line"- both in terms of defining reference conditions and in the allowable risk associated with recreational use attainment. Reference conditions are defined as:

- (a) for protecting aesthetics, the percent frequency of "slightly impaired" conditions based on perception data;
- (b) for protecting swimmers from poor clarity, the existing NYS Department of Health water clarity criteria for establishing new swimming beaches;
- (c) for preventing algal blooms, the definition of "nuisance bloom" conditions
- (d) for minimizing the presence of algal toxins, the microcystin threshold for "moderate probability" of acute health effects established by the World Health Organization

The final AWQVs will also be established by identifying the allowable frequency in violating these criteria (exceeding the chlorophyll *a* and total phosphorus criteria, or falling below the water clarity criteria).

b) Primary Contact Recreation Protection for Flowing Waters (A.J. Smith and Scott Kishbaugh)

Survey work was conducted during the 2008 field season, utilizing field perception surveys comparable to those used in the ponded waters assessments. Survey results will be paired with stressor (phosphorus and nitrogen) and response variables (chlorophyll *a*, Secchi disk transparency, periphyton, and turbidity) to evaluate correlations between these variables and perception responses. Definitions of acceptable impacts (the determination about where to draw the line) adopted in the ponded water nutrient criteria development process will inform the process for identifying acceptable impacts in flowing waters. It is anticipated that the process for developing draft criteria for flowing waters will be lagged behind the criteria process for ponded waters for at least two years, to allow for sufficient data collection across ranges of large river systems, flow regimes, and ecoregions to determine if these gradients need to be built into the draft criteria.

3. FRESHWATER NUTRIENT CRITERIA TO PROTECT AQUATIC LIFE

a. Aquatic Life Protection for Flowing Waters: Nutrients and Biotic Communities (A.J. Smith)

Levels of nutrient concentrations for both nitrogen and phosphorus above which the aquatic invertebrate communities become degraded have been established as a result of research conducted throughout NYS. This work is summarized in Smith et al. (2007), Smith and Tran (2010), and Smith et al. (in-press). Based on results of these studies, NYS can now derive an ambient nutrient standard or guidance value in terms of levels of nitrogen and phosphorus that would not cause impairment of the biotic assemblage as measured by macroinvertebrates and periphyton communities. In addition, these studies developed and calibrated a biotic index of nutrient enrichment for macroinvertebrates in New York State which is now used in the detection and prediction of water quality impact resulting from non-point source nutrient inputs. It also allows New York State to associate ranges of nutrient concentration with changes in biotic communities. Therefore it is possible to identify levels of nutrients which cause perturbation and establish nutrient impairment criteria for wadeable streams. The nutrient biotic index developed through these efforts will be used as the primary response variable for assessing nutrients and act as biological criteria for listing and assessment purposes.

References:

Smith, A. J., R. W. Bode, and G. S. Kleppel. 2007. A nutrient biotic index (NBI) for use with benthic macroinvertebrate communities. *Ecological Indicators* 7:371-386

Smith, A. J., and C. P. Tran. 2010. A weight-of-evidence approach to define nutrient criteria protective of aquatic life in large rivers. *Journal of the North American Benthological Society*. 29(3):875-891

Smith, A. J., R. L. Thomas, J. K. Nolan, D. J. Velinsky, S. Klein, and B. T. Duffy. Regional nutrient thresholds in wadeable streams of New York State protective of aquatic life. In-Press

b. Aquatic Life Protection for Lakes and Reservoirs (A.J. Smith)

Research is to be conducted which will evaluate the integrity of aquatic life in lakes and reservoirs in relation to eutrophication from phosphorus and nitrogen. Biological communities are being sampled in a subset of lakes from across NYS in 2008 - 2012 as part of the NYS ambient lake water quality monitoring program. As data is collected nutrient criteria will be inferred based on the relationships between nutrient concentrations and biological community integrity. This is to be an ongoing project and sufficient data for drawing conclusions regarding nutrient criteria is not

expected until after several years of sampling and data analysis has been conducted. Staff from the Division of Fish and Wildlife and Marine Resources is also being consulted to draw on existing data and staff review of open literature to evaluate whether changes in other biological indicators (fish, plankton, macrophytes, etc) may be more sensitive to or more strongly associated with nutrient overenrichment.

4. NUTRIENT CRITERIA FOR ESTUARIES (Karen Chytalo, Division of Fish, Wildlife and Marine Resources)

There are several studies that have been completed or are underway that should help inform the process for deriving these criteria. These include long-term Eelgrass monitoring studies in the Peconic Estuary which examined nutrients, water quality (surface and groundwater) and light limitations; Tidal Wetland nutrient/water quality studies in Jamaica Bay, Long Island Sound and the South Shore; Western South Shore Bays modeling and data collection to link nutrients and Ulva (sea lettuce) problems, and harmful algal blooms/nutrients in Northport Harbor. Nutrient loadings have been examined in Long Island Sound, Jamaica Bay, Peconic Estuary and the South Shore bays.

As mentioned above, criteria will first be developed and established for the critical nutrient, Nitrogen; criteria for phosphorus will be developed later as resources permit.

NY will work closely with USEPA Region 2 as well as staff of the USEPA's Atlantic Ecology Division lab in Narragansett, Rhode Island in the development of these criteria.

5. IMPLEMENTATION AND NEXT STEPS

The scope of the numeric nutrient criteria effort cannot be overestimated. Its impact may be significant and widespread, and will have to be carefully evaluated for virtually every municipal discharger of wastewater in the State. It is expected to have wide ranging impacts upon non-point sources as well.

Consequently it will also have implications for a wide range of DEC water quality programs. As part of its numeric nutrient criteria effort, DEC has identified multiple areas of program impact where these implications must be evaluated in order to insure a final plan that can be effectively and successfully implemented. These areas, or modules, include:

Water Quality Standards – Work in this area involves review of available data, consideration of causal and response relationships, and the evaluation of use support (water supply, recreation, and aquatic life) in lakes, rivers, and streams in order to develop specific criteria, or a range of criteria. This effort, which has been underway for quite some time, is outlined in some details in other parts of this Nutrient Standards Plan.

Assessment and Listing – Based on existing interpretation of the narrative standards, nutrients are cited as a significant contributor to over half the waters currently assessed as impacted and over 20% of waters currently listed of the Section 303(d) List of Impaired Waters. It is likely that nutrient impacts will continue to drive a large percentage of listings. Crafting numeric nutrient criteria that recognize distinctions between impaired waters (in need of restoration) and impacted waters (in need of protection) is critical for the effective incorporation into the assessment and listing program.

Implementation – Numeric nutrient criteria will drive State Pollutant Discharge Elimination System (SPDES) permit limits, Municipal Separate Storm Sewer Systems (MS4) and other general permit requirements and water quality targets for total maximum daily loads (TMDLs). Questions regarding just how (and how quickly) new numeric criteria will be incorporated into these permitting programs must be answered, and a strategy to implement the criteria into the regulatory program must be developed in conjunction with the criteria themselves.

Communication – As noted above, the impact of numeric nutrient criteria will be significant and far-reaching. Therefore the criteria, as well as the resulting impacts on assessment and listing, permitting programs, the regulated community and the environment, require a robust public discussion.

The proposing of numeric nutrient criteria without a strategy to address the resulting impacts on assessment, listing and regulatory implementation would clearly create more questions than it would answer. And any policy that generates more questions than it answers is bad policy. Therefore DEC plans to propose numeric nutrient criteria only after the issues surrounding impacts to these other areas have been fully addressed, a corresponding implementation plan has been developed, and appropriate outreach to explain the effort and its impacts to stakeholders has been completed.